

Day3



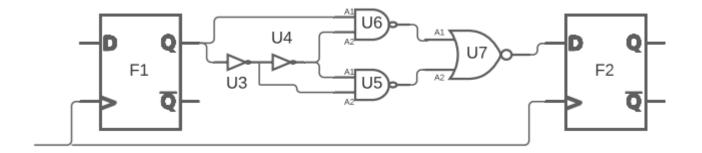


Running the lab

- Type "cd lab3"
- Run 'sta run.tcl -noexit | tee out.txt'

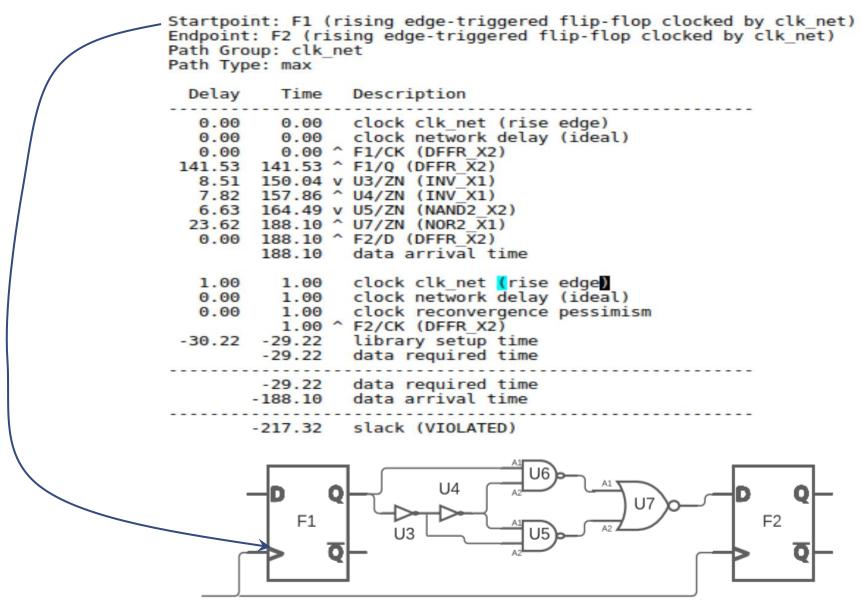


- Consider the following picture
- How many paths do you see F1:CK \rightarrow F2:D?
 - $F1:CK \rightarrow U3 \rightarrow U4 \rightarrow U6:A2 \rightarrow U7:A1 \rightarrow F2:D$
 - $F1:CK \rightarrow U6 \rightarrow U4 \rightarrow U5:A1 \rightarrow U7:A2 \rightarrow F2:D$
 - $F1:CK \rightarrow U6:A1 \rightarrow U7:A1 \rightarrow F2:D$
 - $F1:CK \rightarrow U6 \rightarrow U5:A2 \rightarrow U7:A2 \rightarrow F2:D$
- Type 'leafpad out.txt' the slack reported for the path is -217.323
- Which of the 4 paths above it corresponds to







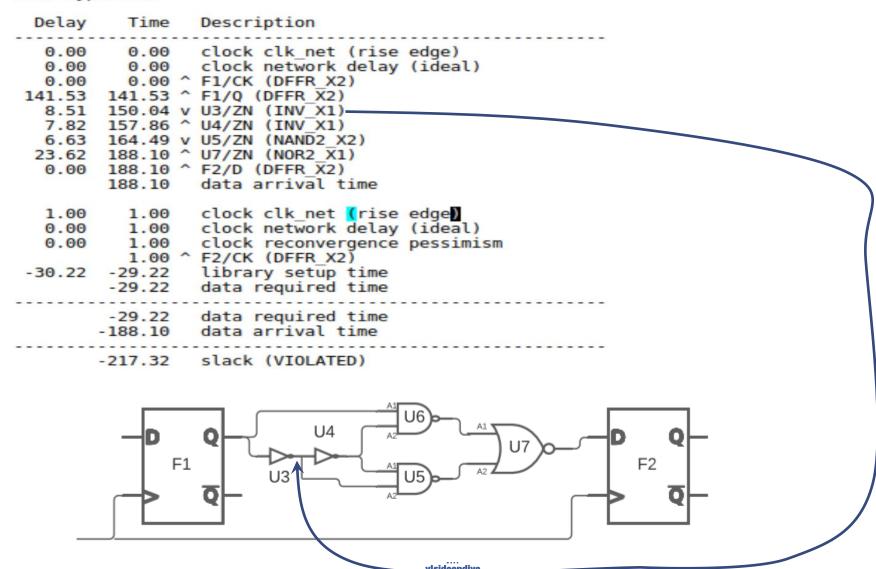




Startpoint: F1 (rising edge-triggered flip-flop clocked by clk_net)
Endpoint: F2 (rising edge-triggered flip-flop clocked by clk net)

Path Group: clk_net

Path Type: max





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Endpoint: F2 (rising edge-triggered flip-flop clocked by clk_net)

Path Group: clk net Path Type: max

rath Type. max				
Delay Time Description				
0.00				
7.82 157.86 ^ U4/ZN (INV_X1) 6.63 164.49 v U5/ZN (NAND2_X2) 23.62 188.10 ^ U7/ZN (NOR2_X1) 0.00 188.10 ^ F2/D (DFFR_X2) 188.10 data arrival time				
1.00 1.00 clock clk_net (rise edge) 0.00 1.00 clock network delay (ideal) 0.00 1.00 clock reconvergence pessimism 1.00 ^ F2/CK (DFFR_X2) -30.22 -29.22 library setup time -29.22 data required time				
-29.22 data required time -188.10 data arrival time				
-217.32 slack (VIOLATED)				
P Q U3 U4 A2 U7 P Q F2 Q				
vlsideepdive				



Startpoint: F1 (rising edge-triggered flip-flop clocked by clk_net)
Endpoint: F2 (rising edge-triggered flip-flop clocked by clk_net) Path Group: clk net

Path Type: max

racii Type.	IIIGA				
Delay	Time	Description			
0.00 0.00 141.53 14 8.51 15 7.82 15 6.63 16 23.62 18 0.00 18	1.53 ^ 0.04 v 7.86 ^ 4.49 v 8.10 ^				
0.00 0.00 -30.22 -2	1.00 1.00 1.00 1.00 ^ 9.22 9.22	clock clk_net (rise edge) clock network delay (ideal) clock reconvergence pessimism F2/CK (DFFR_X2) library setup time data required time	\		
	9.22 8.10	data required time data arrival time			
-21	7.32	slack (VIOLATED)	/		
P Q U4 A1 U7 P Q F2 Q VIsideepilve					



Startpoint: F1 (rising edge-triggered flip-flop clocked by clk_net)
Endpoint: F2 (rising edge-triggered flip-flop clocked by clk_net) Path Group: clk net

Path Type: max

Path Type	: max	
Delay	Time	Description
8.51 7.82 6.63 23.62 0.00	0.00 0.00 ^ 141.53 ^ 150.04 v 157.86 ^ 164.49 v 188.10 ^	clock clk_net (rise edge) clock network delay (ideal) F1/CK (DFFR_X2) F1/Q (DFFR_X2) U3/ZN (INV_X1) U4/ZN (INV_X1) U5/ZN (NAND2_X2) U7/ZN (NOR2_X1) F2/D (DFFR_X2) data arrival time
	1.00 1.00 1.00 1.00 ^ -29.22 -29.22	clock clk_net {rise edge} clock network delay (ideal) clock reconvergence pessimism F2/CK (DFFR_X2) library setup time data required time
	-29.22 188.10	data required time data arrival time
-	217.32	slack (VIOLATED)
	Q F1 Q	U4 A2 U7 P F2 P
		vlsideepdive



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Startpoint: F1 (rising edge-triggered flip-flop clocked by clk_net)
Endpoint: F2 (rising edge-triggered flip-flop clocked by clk_net)
Path Group: clk_net
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Path Type: max				
Delay	Time	Description		
0.00 0.00 0.00 141.53 8.51 7.82 6.63 23.62 0.00	141.53 ^ 150.04 v 157.86 ^ 164.49 v 188.10 ^			
0.00	1.00	clock clk_net (rise edge) clock network delay (ideal)		
0.00	1.00	clock reconvergence pessimism F2/CK (DFFR X2)		
-30.22	-29.22 -29.22	library setup time data required time		
	-29.22 -188.10	data required time data arrival time		
	-217.32	slack (VIOLATED)		
D	Q - {	U4 A2 U7 P F2 P		
		vlsideepdive		



visideepdive Exercises

- Change the number of paths being reported to 100
 - report_checks –from F1/CK -endpoint_count 100
 - Analyze each path in detail and understand

